SALMON AND STEELHEAD HABITAT LIMITING FACTORS

CHEHALIS BASIN AND NEARBY DRAINAGES
WATER RESOURCE INVENTORY AREAS 22 AND 23

WASHINGTON STATE

CONSERVATION COMMISSION

FINAL REPORT

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EXECUTIVE SUMMARY

As directed under Engrossed Substitute House Bill 2496 and Second Engrossed Second Substitute Senate Bill 5595, the habitat conditions of salmonid-producing watersheds within WRIAs 22 and 23 are reviewed and rated. In addition, we prioritized sub-basins based upon greatest benefit to salmonids, and prioritized the actions (restoration, conservation, and assessments) that are needed for restoration of each individual sub-basin. The worst habitat problems are summarized here, but an overview of all the habitat ratings is provided in Table 40 in the Assessment Chapter. The Assessment Chapter also specifies the criteria used to rate habitat conditions. Other components of this report include detailed discussions for each of the habitat conditions, which can be found within the Habitat Limiting Factors Chapter of this report. Also, maps of updated salmon and steelhead trout distribution, large woody debris (LWD) conditions, and riparian conditions are located in a separate electronic file on this disc. This first round report examines salmon and steelhead trout habitat conditions. Later versions will address habitat issues for other salmonids.

The streams addressed in this report include all streams in WRIAs 22 and 23 that have known salmon or steelhead usage. This includes the Grays Harbor estuary, the mainstem Chehalis River, streams that drain into the Chehalis River, and independent streams that drain into Grays Harbor such as the Humptulips River, Hoquiam River, Wishkah River, Elk River, Johns River, and other independent sub-basins. The report begins with the Grays Harbor estuary and continues upstream on a sub-basin by sub-basin approach.

One major impediment to assess the fish distribution and habitat conditions in these two WRIAs is the tremendous lack of detailed field information. While the Chehalis drainage is the second largest in Washington State (second to the Columbia River), only eight watershed analyses have been completed, and of those, two are in areas upstream of most anadromous salmonid production. Assessments regarding sedimentation, off-channel habitat, channel conditions (incision, aggradation, etc), water usage, water quality, salmonid escapement estimates, fish habitat use, stream flow, instream habitat components (pools, LWD, etc), riparian conditions, and landcover are some of the major categories where data are lacking. Also, the Chehalis basin is far behind most other areas in the State regarding assessment and prioritization of fish habitat blockages. Very few surveys of blockages have been conducted that include impacts to salmonids, and the existing information is scattered among various landowners. The potential impact of blockages to fish habitat is considerable because of the high road densities. Using NMFS standards, none of the sub-basins rate “good” for road density and most rate “poor”. Fish distribution data are also generally not as complete as in other areas of Washington State. Several sub-basins are not annually surveyed. Without proper assessment of fish presence and abundance, it will be difficult to accurately use fish data to define impacts and recovery success and to monitor projects and recovery progress.

The Technical Advisory Group (TAG), combined with local citizens, used fish data (number of stocks and number of stream miles with known salmon and steelhead presence) to prioritize sub-basins within these two WRIAs. High priority sub-basins

include the: Grays Harbor estuary, mainstem Chehalis River, Humptulips, Hoquiam, Wishkah, Wynoochee, Satsop, Black River, Skookumchuck, Newaukum, and the South Fork Chehalis sub-basins. Medium priority sub-basins are Johns, Elk River, Cloquallum, Delezene, Rock/Williams, Garrard, Scatter, Lincoln, Elk Creek, and the upper Chehalis River and tributaries (upstream of Pe Ell). Low priority sub-basins include Newman, Workman, Porter, Gibson, Cedar, Independence, Stearns, Dillenbaugh, Salzer, Bunker, and Rock Creek (near Crim Creek). Furthermore, action recommendations and data needs are prioritized for each of these sub-basins, and those are detailed in the prioritization section near the end of the report.

No one, single "bottleneck" is currently believed to most impact natural salmonid production in these two WRIAs. In the early 1990s, Schroder and Fresh (1992) documented severe water quality problems in Grays Harbor that resulted in a significant loss of coho smolt production. However, several causes of the water quality problems have been addressed, and the TAG believes that current water quality conditions in the Grays Harbor estuary have improved. One major data need is to better assess current water quality and potential impacts to salmonids in Grays Harbor. The estimated loss of estuarine habitat is 30% and this is believed to be an underestimate. However, compared to estuaries elsewhere in Washington State, this is a low level of loss. Dredging impacts are another concern within Grays Harbor.

The mainstem Chehalis River has severe impacts from channel incision, sedimentation, riparian loss or conversion, water quality problems, and reduction in stream flow, and many of these problems are translated to the mainstem Chehalis River from tributaries. The causes of channel incision are not well defined. In the upper Chehalis, debris torrents have led to incision. Downstream, potential causes of incision include increased sediment transport due to increased sediment loads from tributaries coupled with an extensive loss of LWD. Also, increased peak flows due to urbanization and changes in landcover vegetation is another suspected cause. While local bank erosion is common along the mainstem, large sediment loads enter the mainstem Chehalis from the tributaries. In order of contribution, those that contribute the most sediment are the Satsop, Wynoochee, and three areas in WRIA 23 (the Newaukum, South Fork Chehalis, and upper Chehalis sub-basins). To address sediment problems in the mainstem, actions must occur in those sub-basins. There has also been an extensive loss of riparian vegetation along the mainstem, coupled with conversion of conifer to hardwoods. This contributes to bank erosion, warm water temperatures, and lack of LWD. The causes of riparian loss to the mainstem are mainly agriculture and urbanization.

Water quality problems are well documented in the mainstem Chehalis River upstream of Porter Creek, particularly for warm water temperatures and low dissolved oxygen levels. The temperature problems are likely related to riparian loss, increased sedimentation resulting in channel changes (width –to-depth ratios), and decreased water flows, not only in the mainstem Chehalis, but also in tributaries. The priority mainstem segments for riparian restoration include the Chehalis River mainstem from Porter Creek to the headwaters. The primary causes for low dissolved oxygen levels are livestock waste and urban stormwater. The priority areas to address those problems include Salzer Creek, the

mainstem Chehalis River at RM 70.7 and from RM 77.6 to 97.9, Dillenbaugh Creek, the South Fork Chehalis River, Black River, Lincoln Creek, Independence Creek, and Scatter Creek. Warm water temperatures and low dissolved oxygen levels are also documented in many of the tributaries, such as in the Humptulips, Wynoochee, Satsop, Wildcat, Independence, Lincoln, Black, Scatter, Skookumchuck, Salzer, Dillenbaugh, Newaukum, Stearns, Bunker, South Fork Chehalis, and upper Chehalis sub-basins. The known causes of the poor water quality problems in these sub-basins are riparian loss or conversion, livestock waste, sedimentation, decreased flows, industrial inputs, and urban stormwater. It is also likely that the reduction in wetlands has contributed to degraded water quality. Recommended solutions include riparian restoration, sediment load and transport reduction, decreasing livestock waste inputs, decreasing industrial and urban inputs, and increasing stream flows during the summer to early fall.

Low stream flows are an increasing problem in the mainstem Chehalis, and the problem extends throughout many of the tributaries. Since 1953, mainstem flows measured near Porter decreased 19%, while annual precipitation decreased only 6% (Wildrick et al. 1995). Many tributaries to the mainstem Chehalis River from Porter Creek upstream are closed to further water rights allocations, because of concerns that base flows are not being met. The closed streams are Wildcat Creek, Mox Chehalis Creek, Rock Creek, Garrard Creek, Hope Creek, Lincoln Creek, Black River and several tributaries, Scatter Creek, Salzer Creek, Dillenbaugh Creek, Stearns Creek, Bunker Creek, and the South Fork Chehalis River. In addition, base flows are often not met in the Satsop, Wynoochee, Skookumchuck, and Newaukum sub-basins. The primary water users in the WRIA 23 drainage are irrigation (top user), power generation, and domestic water use (Wildrick et al. 1995). Also, groundwater is important to maintain summer flows in WRIA 23, and potential increases in groundwater withdrawals would worsen stream flow conditions in the summer months.

Riparian degradation is extensive throughout the sub-basins, particularly the Wynoochee, Satsop, Cloquallum, Garrard, Lincoln, Skookumchuck, Newaukum, Salzer, Bunker, and the South Fork Chehalis sub-basins. The lower reaches of most of the other sub-basins have “poor” riparian conditions, as well. Instream levels of LWD are generally low, where levels are known.

Excess sediment delivery is a major problem throughout most of the sub-basins. In those with moderate to steep slopes, landslides from roads are one of the greatest problems, and sidecast roads pose a notable risk. Road density is high throughout all the sub-basins, especially in the upper Chehalis (6.4 mi roads/sq mi watershed) and Scatter Creek (5.3 mi/sq mi). Road densities greater than 3 mi/sq mi are found in the Stearns, Skookumchuck, Newman, Mox Chehalis, Delezene, Workman, Bunker, Newaukum, Elk Creek, Rock (near Crim Creek), Black, Lincoln, Independence, Elk River, Johns, Wishkah, and the Hoquiam sub-basins. Bank erosion is common in the agricultural and urban areas, with high levels in the Wynoochee, Satsop, Newman, Porter, Gibson, Black, Skookumchuck, Newaukum, Stearns, South Fork Chehalis, Crim-Rock, upper Chehalis, Elk Creek, Scammon, Lincoln, Rock/Williams, and Workman/Delezene sub-basins. The high levels of sedimentation coupled with the low levels of LWD result in high sediment

transport rates. This can increase the impact of scour, channel incision, and width-to-depth ratios, and reduce habitat complexity.

Floodplain impacts are generally not well-documented, and because the Chehalis basin is the third greatest coho salmon smolt producer in Western Washington (Seiler 2000), and coho salmon depend heavily on side-channel and off-channel rearing habitat, floodplain habitat should be a high priority issue. Known "poor" floodplain conditions exist in the lower Skookumchuck and Hanaford sub-basin due to bank protection and channelization. Other floodplain impacts such as channel incision or loss of refuge habitat have been identified in parts of the Newaukum, Satsop, Wynoochee, Wishkah, Hoquiam, Newman, Cloquallum, China, Salzer, and Stearns sub-basins. The causes of floodplain impacts are poorly documented, but suspected causes include increased sediment transport (leading to channel incision), bank hardening, and filling and draining of wetlands by urbanization and agriculture. The loss of LWD has likely contributed to a loss of side-channel habitat. One area of excellent floodplain habitat exists in the lower mainstem Chehalis from RM 1-11, and this area is a high priority conservation need.

The problems within these two WRIAs are numerous and intertwined. Solutions to a given problem might be varied, such as addressing water quality issues by riparian restoration, stream flow increases, or sediment reduction. Reducing livestock access will aid not only water quality conditions, but also bank erosion and riparian development. Recommended efforts should consider the restoration of natural processes, as those will likely be the most successful actions over the long-term. These include reducing human-caused sedimentation, improving riparian conditions, restoration of natural stream flows, and a return to natural floodplain conditions, especially in the high priority sub-basins.